

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Duvillier et al.

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Examiner: UNASSIGNED

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Title: SYSTEM MODIFICATION PROCESSING
TECHNIQUE IMPLEMENTED ON AN
INFORMATION STORAGE AND
RETRIEVAL SYSTEM

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Before examination on the merits, please amend the subject patent application as follows.

In the Claims:

Please cancel claims 1-71 and substitute the following new claims 72-139 therefore:

--72. A method for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the method comprising:

receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

73. The method of claim 72 wherein said implementing includes closing at least one table space associated with the first data file.

74. The method of claim 72 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

75. The method of claim 72 wherein the at least one data file includes a disk drive.

76. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein implementation of the first system modification request further includes copying object data from the primary data file to the mirror data file.

77. The method of claim 76 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

78. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further includes swapping assignments of the primary and mirror data files.

79. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

80. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further comprises copying object data stored on the primary data file to at least one other data file in the persistent memory.

81. The method of claim 80 wherein the first system modification request is implemented without closing a table space of the at least one other data file.

82. The method of claim 72 further comprising implementing the first system modification request concurrently while providing database access to end users.

83. The method of claim 82 wherein said database access includes read access to object data stored on the first data file.

84. The method of claim 82 wherein said database access includes write access to the persistent memory for storing updated object data relating to the first object.

85. The method of claim 82 database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

86. The method of claim 72 further comprising performing an update to the first object concurrently while implementing the first system modification request.

87. The method of claim 72 wherein the implementing of the first system modification request is performed in real-time, without blocking access to object data stored in the persistent memory.

88. A computer program product, the computer program product including a computer usable medium having computer readable code embodied therein, the computer readable code comprising computer code for implementing the method of claim 72.

89. A method for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including a first data file and a second data file, the first data file including first object data stored therein, the method comprising:

receiving a first system modification request to remove the first data file from the persistent memory;

implementing removal of the first data file from the persistent memory; and

providing continuous access to object data stored in the persistent memory concurrently during the removal of the first data file.

90. The method of claim 89 further comprising providing continuous data update access to the first object data concurrently during the removal of the first data file.

91. The method of claim 90 wherein the removal of the first data file includes copying the first object data to the second data file.

92. The method of claim 89 wherein said implementing includes closing at least one table space associated with the first data file.

93. The method of claim 89 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

94. The method of claim 89 wherein the first data file includes a disk drive.

95. The method of claim 89 wherein the removal of the first data file from the persistent memory is accomplished in real-time without taking the information storage and retrieval system off-line.

96. A computer program product, the computer program product including a computer usable medium having computer readable code embodied therein, the computer readable code comprising computer code for implementing the method of claim 89.

97. An information storage and retrieval system comprising:

at least one processor; and
memory;
the memory including persistent memory configured or designed to store object data;
the system being configured or designed to receive a first system modification request relating to a first data file, the first data file including a first object stored therein;
the system being further configured or designed to implement the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and
the system being further configured or designed to store updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

98. The system of claim 97 being further configured or designed to close at least one table space associated with the first data file during implementation of the first system modification request.

99. The system of claim 97 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

100. The system of claim 97 wherein the at least one data file includes a disk drive.

101. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein implementation of the first system modification request further includes copying object data from the primary data file to the mirror data file.

102. The system of claim 101 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

103. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further includes swapping assignments of the primary and mirror data files.

104. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

105. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further comprises copying object data stored on the primary data file to at least one other data file in the persistent memory.

106. The system of claim 105 wherein the first system modification request is implemented without closing a table space of the at least one other data file.

107. The system of claim 97 being further configured or designed to implement the first system modification request concurrently while providing database access to end users.

108. The system of claim 107 wherein said database access includes read access to object data stored on the first data file.

109. The system of claim 107 wherein said database access includes write to the persistent memory for storing updated object data relating to the first object.

110. The system of claim 107 wherein said database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

111. The system of claim 97 being further configured or designed to perform an update to the first object concurrently while implementing the first system modification request.

112. The system of claim 97 being further configured or designed to implement the first system modification request in real-time, without blocking access to object data stored in the persistent memory.

113. An information storage and retrieval system comprising:

at least one processor; and

memory;

the memory including persistent memory configured or designed to store object data;

the system being configured or designed to receive a first system modification request to remove the first data file from the persistent memory;

the system being further configured or designed to implement removal of the first data file from the persistent memory; and

the system being further configured or designed to provide continuous access to object data stored in the persistent memory concurrently during the removal of the first data file.

114. The system of claim 113 being further configured or designed to provide continuous data update access to the first object data concurrently during the removal of the first data file.

115. The system of claim 114 wherein the removal of the first data file includes copying the first object data to the second data file.

116. The system of claim 113 being further configured or designed to close at least one table space associated with the first data file during implementation of the first system modification request.

117. The system of claim 113 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

118. The system of claim 113 wherein the first data file includes a disk drive.

119. The system of claim 113 being further configured or designed to implement removal of the first data file from the persistent memory in real-time without taking the information storage and retrieval system off-line.

120. A computer program product for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

computer code for implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

computer code for storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

121. The computer program product of claim 120 wherein said implementing code includes computer code for closing at least one table space associated with the first data file.

122. The computer program product of claim 120 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

123. The computer program product of claim 120 wherein the at least one data file includes a disk drive.

124. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein the computer code for implementing the first system modification request includes computer code for copying object data from the primary data file to the mirror data file.

125. The computer program product of claim 124 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

126. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein the computer code for implementing the first system modification request includes computer code for swapping assignments of the primary and mirror data files.

127. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

128. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein the computer code for implementing the first system modification request comprises computer code for copying object data stored on the primary data file to at least one other data file in the persistent memory.

129. The computer program product of claim 128 further comprising computer code for implementing the first system modification request without closing a table space of the at least one other data file.

130. The computer program product of claim 120 further comprising computer code for implementing the first system modification request concurrently while providing database access to end users.

131. The computer program product of claim 130 wherein said database access includes read access to object data stored on the first data file.

132. The computer program product of claim 130 wherein said database access includes write access to the persistent memory for storing updated object data relating to the first object.

133. The computer program product of claim 130 database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

134. The computer program product of claim 120 further comprising computer code for performing an update to the first object concurrently while implementing the first system modification request.

135. The computer program product of claim 120 further comprising computer code for implementing the first system modification request in real-time, without blocking access to object data stored in the persistent memory.

136. A system for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the computer program product comprising:

means for receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

means for implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

means for storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

137. The computer program product of claim 136 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

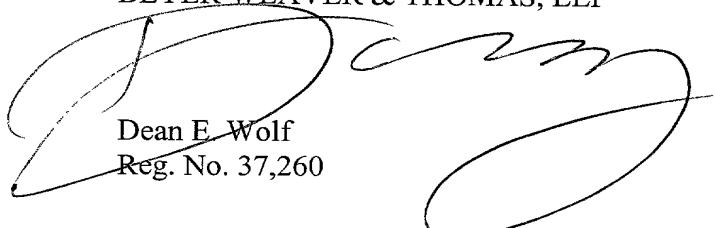
138. The computer program product of claim 136 further comprising means for performing an update to the first object concurrently while implementing the first system modification request.

139. The computer program product of claim 136 further comprising means for implementing the first system modification request in real-time, without blocking access to object data stored in the persistent memory.--

REMARKS

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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APPENDIX OF PENDING CLAIMS

72. A method for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the method comprising:

receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

73. The method of claim 72 wherein said implementing includes closing at least one table space associated with the first data file.

74. The method of claim 72 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

75. The method of claim 72 wherein the at least one data file includes a disk drive.

76. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein implementation of the first system modification request further includes copying object data from the primary data file to the mirror data file.

77. The method of claim 76 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

78. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further includes swapping assignments of the primary and mirror data files.

79. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

80. The method of claim 72 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further comprises copying object data stored on the primary data file to at least one other data file in the persistent memory.

81. The method of claim 80 wherein the first system modification request is implemented without closing a table space of the at least one other data file.

82. The method of claim 72 further comprising implementing the first system modification request concurrently while providing database access to end users.

83. The method of claim 82 wherein said database access includes read access to object data stored on the first data file.

84. The method of claim 82 wherein said database access includes write access to the persistent memory for storing updated object data relating to the first object.

85. The method of claim 82 database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

86. The method of claim 72 further comprising performing an update to the first object concurrently while implementing the first system modification request.

87. The method of claim 72 wherein the implementing of the first system modification request is performed in real-time, without blocking access to object data stored in the persistent memory.

88. A computer program product, the computer program product including a computer usable medium having computer readable code embodied therein, the computer readable code comprising computer code for implementing the method of claim 72.

89. A method for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including a first data file and a second data file, the first data file including first object data stored therein, the method comprising:

receiving a first system modification request to remove the first data file from the persistent memory;

implementing removal of the first data file from the persistent memory; and

providing continuous access to object data stored in the persistent memory concurrently during the removal of the first data file.

90. The method of claim 89 further comprising providing continuous data update access to the first object data concurrently during the removal of the first data file.

91. The method of claim 90 wherein the removal of the first data file includes copying the first object data to the second data file.

92. The method of claim 89 wherein said implementing includes closing at least one table space associated with the first data file.

93. The method of claim 89 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

94. The method of claim 89 wherein the first data file includes a disk drive.

95. The method of claim 89 wherein the removal of the first data file from the persistent memory is accomplished in real-time without taking the information storage and retrieval system off-line.

96. A computer program product, the computer program product including a computer usable medium having computer readable code embodied therein, the computer readable code comprising computer code for implementing the method of claim 89.

97. An information storage and retrieval system comprising:

at least one processor; and

memory;

the memory including persistent memory configured or designed to store object data;

the system being configured or designed to receive a first system modification request relating to a first data file, the first data file including a first object stored therein;

the system being further configured or designed to implement the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

the system being further configured or designed to store updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

98. The system of claim 97 being further configured or designed to close at least one table space associated with the first data file during implementation of the first system modification request.

99. The system of claim 97 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

100. The system of claim 97 wherein the at least one data file includes a disk drive.

101. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein implementation of the first system modification request further includes copying object data from the primary data file to the mirror data file.

102. The system of claim 101 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

103. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further includes swapping assignments of the primary and mirror data files.

104. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

105. The system of claim 97 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein implementation of the first system modification request further comprises copying object data stored on the primary data file to at least one other data file in the persistent memory.

106. The system of claim 105 wherein the first system modification request is implemented without closing a table space of the at least one other data file.

107. The system of claim 97 being further configured or designed to implement the first system modification request concurrently while providing database access to end users.

108. The system of claim 107 wherein said database access includes read access to object data stored on the first data file.

109. The system of claim 107 wherein said database access includes write to the persistent memory for storing updated object data relating to the first object.

110. The system of claim 107 wherein said database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

111. The system of claim 97 being further configured or designed to perform an update to the first object concurrently while implementing the first system modification request.

112. The system of claim 97 being further configured or designed to implement the first system modification request in real-time, without blocking access to object data stored in the persistent memory.

113. An information storage and retrieval system comprising:
at least one processor; and
memory;
the memory including persistent memory configured or designed to store object data;
the system being configured or designed to receive a first system modification request to remove the first data file from the persistent memory;

the system being further configured or designed to implement removal of the first data file from the persistent memory; and

the system being further configured or designed to provide continuous access to object data stored in the persistent memory concurrently during the removal of the first data file.

114. The system of claim 113 being further configured or designed to provide continuous data update access to the first object data concurrently during the removal of the first data file.

115. The system of claim 114 wherein the removal of the first data file includes copying the first object data to the second data file.

116. The system of claim 113 being further configured or designed to close at least one table space associated with the first data file during implementation of the first system modification request.

117. The system of claim 113 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

118. The system of claim 113 wherein the first data file includes a disk drive.

119. The system of claim 113 being further configured or designed to implement removal of the first data file from the persistent memory in real-time without taking the information storage and retrieval system off-line.

120. A computer program product for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the computer program product comprising:

a computer usable medium having computer readable code embodied therein, the computer readable code comprising:

computer code for receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

computer code for implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

computer code for storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

121. The computer program product of claim 120 wherein said implementing code includes computer code for closing at least one table space associated with the first data file.

122. The computer program product of claim 120 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

123. The computer program product of claim 120 wherein the at least one data file includes a disk drive.

124. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to add a mirror data file to be associated with the primary data file; and

wherein the computer code for implementing the first system modification request includes computer code for copying object data from the primary data file to the mirror data file.

125. The computer program product of claim 124 wherein the addition of the mirror data file is automatically implemented in response to predetermined criteria.

126. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein the computer code for implementing the first system modification request includes computer code for swapping assignments of the primary and mirror data files.

127. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system further includes a mirror data file associated with the primary data file; and

wherein the system modification request corresponds to a request to take the mirror data file off-line.

128. The computer program product of claim 120 wherein the first data file corresponds to a primary data file;

wherein the system modification request corresponds to a request to take the primary data file off-line; and

wherein the computer code for implementing the first system modification request comprises computer code for copying object data stored on the primary data file to at least one other data file in the persistent memory.

129. The computer program product of claim 128 further comprising computer code for implementing the first system modification request without closing a table space of the at least one other data file.

130. The computer program product of claim 120 further comprising computer code for implementing the first system modification request concurrently while providing database access to end users.

131. The computer program product of claim 130 wherein said database access includes read access to object data stored on the first data file.

132. The computer program product of claim 130 wherein said database access includes write access to the persistent memory for storing updated object data relating to the first object.

133. The computer program product of claim 130 database access includes write access to at least one other data file in the persistent memory for storing updated information relating to at least one object stored on the first data file.

134. The computer program product of claim 120 further comprising computer code for performing an update to the first object concurrently while implementing the first system modification request.

135. The computer program product of claim 120 further comprising computer code for implementing the first system modification request in real-time, without blocking access to object data stored in the persistent memory.

136. A system for implementing system modification operations in an information storage and retrieval system, the information storage and retrieval system including persistent memory configured or designed to store object data, the persistent memory including at least one data file for storing object data, the computer program product comprising:

means for receiving a first system modification request relating to a first data file, the first data file including a first object stored therein;

means for implementing the first system modification request, wherein implementation of the first system modification request includes suspending write access to the first data file; and

means for storing updated information relating to the first object in the persistent memory concurrently while the first system modification request is being implemented.

137. The computer program product of claim 136 wherein the information storage and retrieval system corresponds to a non-positional, non-log based information storage and retrieval system.

138. The computer program product of claim 136 further comprising means for performing an update to the first object concurrently while implementing the first system modification request.

139. The computer program product of claim 136 further comprising means for implementing the first system modification request in real-time, without blocking access to object data stored in the persistent memory.